

AIRCRAFT CIRCULARS

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

No. 89

ALEESSARD "TRIAVION" AIRPLANE (FRENCH)

A Two-Seat Tandem Monoplane

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ALBESSARD "TRIAVION" AIRPLANE (FRENCH)*

A Two-Seat Tandem Monoplane.

By J. Serryer.

The rapid completion of this new type of airplane by the engineer, Louis Peyret, at the expense of and on the data furnished by its inventor, Joseph Albessard, has astonished a large number of persons. More fortunate than the large majority of his fellow inventors, Mr. Albessard has the satisfaction of materializing the result of his patient researches.

The first tests of his airplane proved very satisfactory and Mr. Albessard declared himself personally delighted with them. The "Triavion" flies very correctly, but it may not suit the taste of some persons who have a particular conception of what an airplane should be. The Albessard airplane, in fact, is not endowed with any very great speed. On the other hand, it is not likely to do very well at stunt flying, without which ability, it is claimed, an airplane cannot be sufficiently manageable. Again, it is well to determine, before judging it by strict rules, just what is expected of a certain type of airplane. In having his "Triavion" made, Mr. Albessard, in fact, sought neither speed nor a maneuverability such as a touring airplane can very well do without.

*From Les Ailes, September 2, 1926.

The "Triavion" may be placed in the category of new aircraft like the "Autogiro" and Hill's "Pterodactyl," of which no one has ever thought of requiring such performances (Figs. 1, 2, and 3). The essential characteristic sought in particular and almost exclusively by Mr. Albessard was the autostability inherent in its form. His conception can be stated as follows: "to distribute the supporting airfoils in such a way that their centers of lift would form what is termed the 'polygon' of sustentation," the center of gravity of the whole aircraft being in the vertical line passing through the center of said polygon. The result, as claimed by Mr. Albessard, is a "trim," or stability of form, automatically tending to flatten out the aircraft.

This stability of form is obtained by the special disposition of the wings. These are installed in tandem, the efficiency of airfoils thus arranged being known to be rather poor. Mr. Albessard has, however, as we shall see, discovered a solution of this problem, a solution which also facilitates the very particular placing of the wings.

The front wing has a large central, nonlifting portion of biconvex section or profile and with a span equal to that of the rear surface. According to Mr. Albessard, the current of air flows smoothly past the nonlifting portion of the front wing and reaches the rear wing in an undisturbed condition. The efficiency of the rear wing should therefore be very satisfactory.

Aside from the central portion with zero angle of attack, the front wing is completed by lifting sections on both the right and the left. These sections comprise two of the points of the triangle of lift, the third point being the rear wing.

This device of automatic stability is completed by large ailerons along the lifting portions of the front wing. These ailerons are operated differentially and can be used either to vary the camber of the lifting portions or to assure lateral stability. Lastly, the "Triavion" has normal horizontal and vertical empennages at the rear end of the fuselage. In truth, the presence of these organs is not absolutely necessary, at least as regards the stabilizer and elevator; it being possible, according to Mr. Albessard, for a pilot familiar with the aircraft to take off and land simply with the aid of the ailerons and throttle.

Another characteristic of the Albessard airplane also concerns the safety, which was the principal preoccupation of the inventor. The arrangement of the principal elements renders the airplane nearly noncapsizable. The position of the landing gear with respect to the wings greatly reduces hazards of this nature. Neither has Mr. Albessard neglected the proper safety accessories. Parachutes and an automatic fire extinguisher are included in the normal equipment of the airplane.

From the structural viewpoint, nothing has been spared for obtaining great strength. The prototype has a safety factor of

eight, which was greatly exceeded in the static tests. It weighs considerably more than was anticipated. The wings and fuselage are entirely covered with plywood. The wings are abundantly braced. Lastly, this first specimen being designed for touring, the wings can be easily and quickly folded for storing in a small space.

Take-offs and landings can be made on a very small field by the simple action of the ailerons and of the engine, more or less throttled.

Characteristics

Span of front wings	11.50 m	37.73 ft.
" " rear "	7.60 "	24.93 "
Length	7.00 "	22.97 "
Height of cabin	1.40 "	4.59 "
Total height	2.00 "	6.56 "
Width with wings folded	2.95 "	9.68 "
Lifting surface of front wings	7.70 m ²	82.88 sq.ft.
Lifting surface of rear wings	10.80 "	116.25 "
Total lifting surface	18.50 "	199.13 "
Area of neutral portion	7.50 "	80.73 "
Track gauge	2.00 m	6.56 ft.
Engine, Anzani	70 HP.	

Weight of plane without power plant	200 kg	440.9 lb.
Engine-propeller group	120 "	264.6 "
Fuel and oil for 4.5 hr.	80 "	176.4 "
Pilot and passenger	150 "	330.7 "
Full load	550 "	1212.6 "
Wing loading	29.7 kg/m ²	6.08 lb./sq.ft.
Power "	7.85 kg/HP	17.07 lb./HP.

Theoretical Performances
with 70 HP. Anzani engine

Maximum speed	125 km/h	77.7 mi./hr.
Minimum "	65 "	40.4 "
Ceiling	4800 m	15748 ft.
Range of action at maximum speed	500 km	310.7 mi.
Range of action at economical speed	650 "	403.9 "

Performance with 95 HP. Salmson engine

Maximum speed	140 km/h	87.0 mi./hr.
Minimum speed	54.7 km/h	34.0 mi./hr.
Radius	600 km	373 mi.

Translation by Dwight M. Miner.
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Fig.1

Span of front wing 11.50 m
 (37.73 ft.)

" " rear " 7.60 m
 (24.93 ft.)

Length 7.0 m (22.97 ft.)
 Total lifting surface 18.5 m^2
 (199.13 sq.ft.)

Lifting surface of
 front wings 7.7 m^2
 (82.88 sq.ft.)
 Lifting surface of
 rear wings 10.80 m^2
 (116.25 sq.ft.)

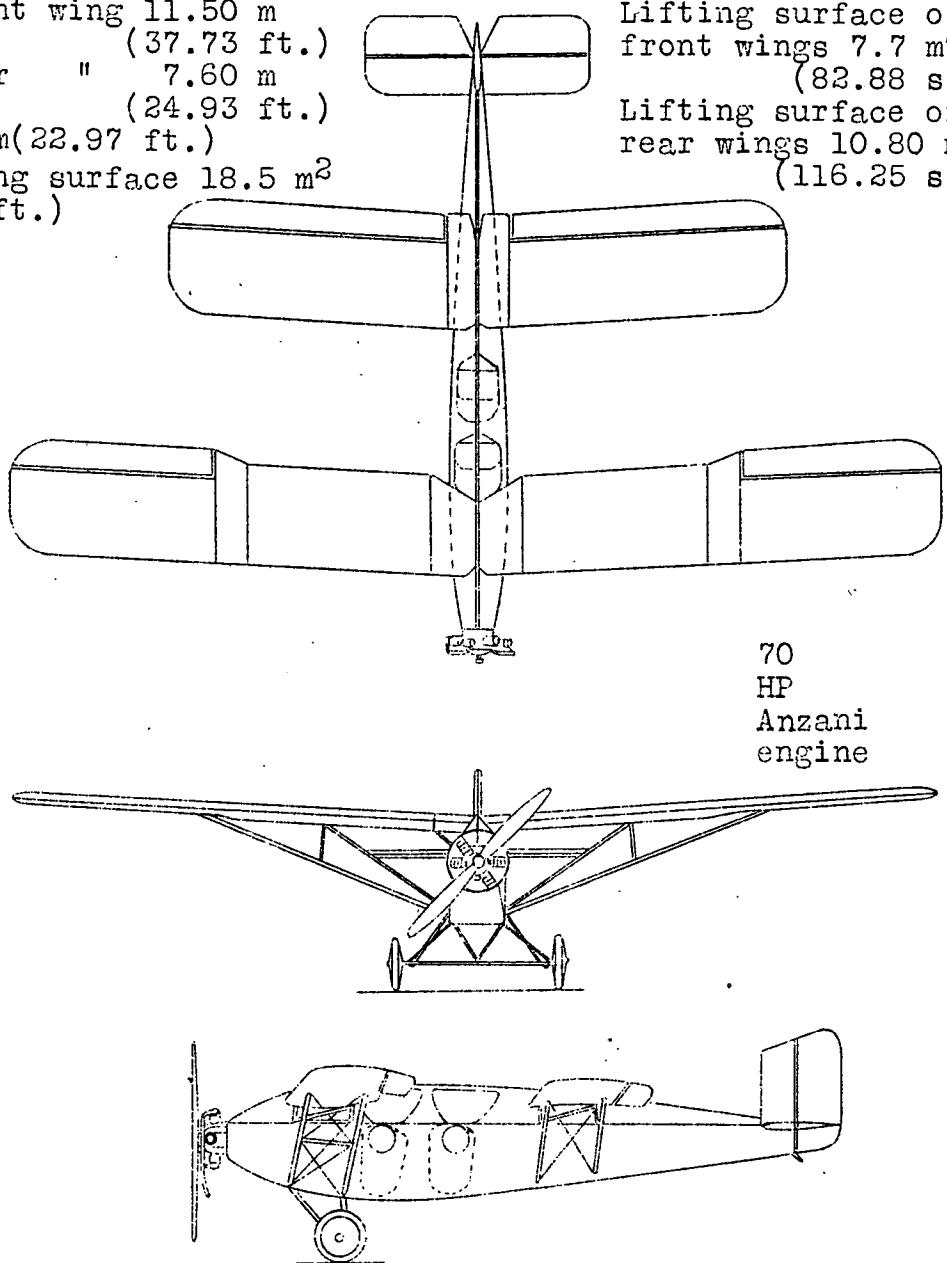


Fig.1 Albessard "Triavion" airplane.

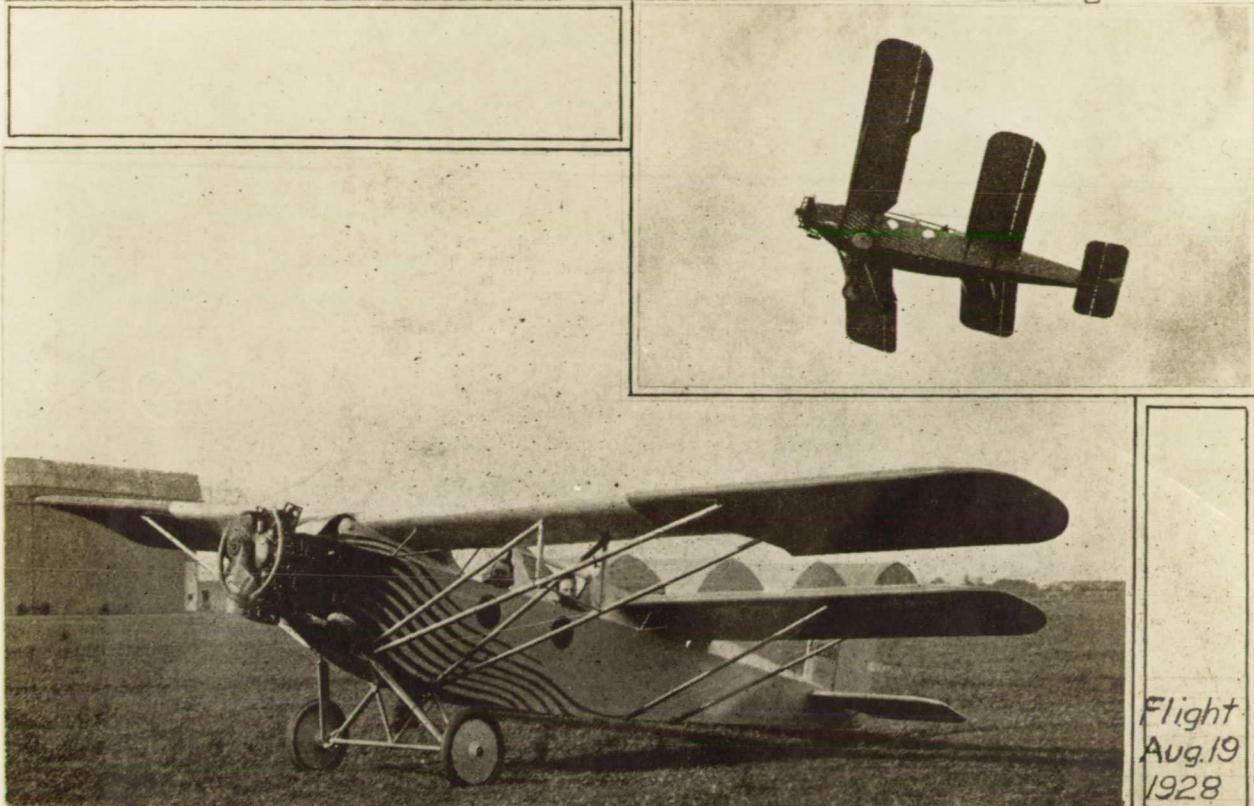


Fig.2 The Albessard tandem monoplane with 70 HP Anzani engine.

Flight
Aug.19
1928



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Fig.3 Albessard "Triavion" airplane.
(95 HP Salmson engine.)

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